REMARKS

I. Introduction

In response to the pending Office Action, Applicants have amended claims 51 and 52 in order to further clarify the subject matter of the present invention. Support for the amendments to claims 51 and 52 may be found, for example, on page 10, lines 12-31 of the specification. No new matter has been added.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. Rejection Of Claims 2, 3, 5 and 51-57 Under 35 U.S.C. § 103

Claims 2, 3, 5 and 51-57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoguchi (USP No. 5,900,647) in view of Onojima et al. (*Appl. Phys. Lett.*, **2003,** 83(25), 5208-10). Applicants respectfully traverse the above-mentioned rejection for at least the following reasons.

With regard to the present invention, amended claims 51 and 52 recite a semiconductor device comprising a first III-V Nitride semiconductor epitaxial film having a main plane of (11-20) and having 4H-polytype structure selectively formed in contact with a substrate having 4H-type structure, wherein said first III-V Nitride semiconductor epitaxial film is a 4H-AlN film, a seed layer of III-V Nitride having 4H-polytype structure selectively formed on said first III-V Nitride semiconductor epitaxial film, wherein said seed layer contains Ga, and has a shape of a stripe along the <1-100> direction.

Two features of the present disclosure are a semiconductor which has a first III-V Nitride epitaxial film having a main plane of (11-20) and a seed layer that has a shape of a stripe along

the <1-100> direction. As is shown in Fig. 12 and disclosed in the specification on page 10, lines 26-31, the stripe is formed in the surface of the 4H-SiC substrate 1201. The stripe width is typically 5μm and the distance of each stripe is 15μm. The direction of the stripe is preferably <1-100> direction, which is perpendicular to the stacking direction. Resultant lateral growth to <1-100> keeps the poly type in the wing region **1212** from that in the seed region **1203**.

As a result of these features, a remarkable effect based on an epitaxial lateral overgrowth is obtained providing excellent crystal quality to the second III-V Nitride semiconductor epitaxial film that is formed in contact with the seed layer. On the contrary, if the direction of the stripe is <0001> direction, the stacking order of the atoms in the wing region **1212** is determined by the growth condition rather than the stacking order in the wing region **1212**.

It is alleged that it would have been obvious to combine Onojima, which discloses a 4H polytype structure, with the semiconductor of Inoguchi. However, Inoguchi fails to teach or suggest a seed layer having a shape of a stripe along the <1-100> direction. In fact, Inoguchi is silent with respect to the direction of the seed layer stripe. Moreover, Inoguchi does not disclose a first III-V Nitride epitaxial film having a main plane of (11-20). Onojima fails to remedy this deficiency. Onojima teaches a 4H-AlN semiconductor film formed by crystal growth on a 4H-SiC substrate. However, nowhere does Onojima teach that the first III-V Nitride semiconductor epitaxial film has a main plane of (11-20) and that the seed layer has a shape of a stripe along the <1-100> direction. In fact, Onojima appears silent with respect to a seed layer. Accordingly, neither Inoguchi nor Onojima teach each of the limitations of claims 51 and 52.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. As Inoguchi and Onojima, at a

minimum, fail to disclose or suggest a semiconductor device comprising a first III-V Nitride semiconductor epitaxial film having a main plane of (11-20) and having 4H-polytype structure selectively formed in contact with a substrate having 4H-type structure, wherein said first III-V Nitride semiconductor epitaxial film is a 4H-AlN film, a seed layer of III-V Nitride having 4H-polytype structure selectively formed on said first III-V Nitride semiconductor epitaxial film, wherein said seed layer contains Ga, and has a shape of a stripe along the <1-100> direction, it is clear that Inoguchi and Onojima, alone or in combination, fail to render amended claims 51 and 52 obvious. As such, Applicants respectfully request that the § 103 rejection of amended claims 51 and 52, and all pending dependent claims thereon, be withdrawn.

III. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 51 and 52 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

IV. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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